In the Claims:

1. (Currently Amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference producing an estimate of the signal transmitted by the transmitter, wherein when using a zero-forcing function, estimates for the signal may be expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is the received signal, A is defined as $H\tilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, *Nc* is the spreading gain, *Q* is the number of received antennas, *M* is the number of multiple users, $\tilde{W}$ is the weighting vector, $\sqrt{\rho_i}$ is the i-th power source, and *Ci* is the i-th spreading code.

2. (Canceled)

3. (Original) The method of claim 1, wherein the computing of the CLTD weighting vector comprises:

calculating a channel estimate from the received signal; and

computing the CLTD weighting vector based on the channel estimate.

4-5. (Canceled)

6. (Currently Amended) The method of claim 1,[[5,]] wherein the computation of the estimates for the signal can be implemented using a parallel or serial interference cancellation technique.

7-8. (Canceled)

9. (Original) The method of claim 1 wherein the using comprises:

equalizing the received signal; and

despreading the equalized received signal.

10. (Original) The method of claim 9, wherein there are multiple users, and wherein the despreading applies spreading codes from each user to the equalized received signal.

11. (Original) The method of claim 9, wherein the equalizing applies the CLTD weighting vector and a channel estimate to the received signal.

12. (Currently Amended) The method of claim 9, wherein ~~when using a zero-forcing function,~~ estimates for the signal may be expressed as:

$$z_{ZF} = (\widetilde{W}^H H^H H \widetilde{W})^{-1} \widetilde{W}^H H^H r,$$

where r is the received signal, H is the channel estimate, and $\widetilde{W}$ is the weighting vector.

13. (Canceled)

14. (Original) The method of claim 9, wherein an equalizer to perform the equalization can be implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

15. (Original) The method of claim 1 wherein the using comprises:

equalizing the received signal;

despreading the equalized received signal; and

coherent combining the despread equalized received signal.

16. (Original) The method of claim 15, wherein the equalizing applies a channel estimate to the received signal.

17-18. (Canceled)

19. (Original) The method of claim 15, wherein there are multiple users, and wherein the despreading applies spreading codes from each user to the equalized received signal.

20. (Original) The method of claim 19, wherein the despreading produces a symbol stream for each user.

21. (Original) The method of claim 15, wherein the coherent combining applies the CLTD weighting vector to despread symbol intervals.

22. (Original) The method of claim 21, wherein there are multiple users, and wherein the coherent combining further applies the channel estimate and spreading codes from each user.

23. (Original) The method of claim 15, wherein an equalizer to perform the equalization can be implemented as a bank of P*Q filters, wherein P is the number of transmit antennas and Q is the number of receive antennas.

24. (Currently Amended) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) comprising:

at a receiver

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter;

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference;

the method further comprising at a transmitter

transmitting a signal;

receiving the CLTD weighting vector; and

applying the CLTD weighting vector to subsequent transmissions; ~~transmissions.~~

wherein when using a zero-forcing function, estimates for the signal may be expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is the received signal, A is defined as $H\tilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the channel estimate, *Nc* is the spreading gain, *Q* is the number of received antennas, *M* is the number of multiple users, $\tilde{W}$ is the weighting vector, $\sqrt{\rho_i}$ is the i-th power source, and *Ci* is the i-th spreading code.

25. (Original) The method of claim 24, wherein the using produces an estimate of the signal transmitted by the transmitter.

26. (Currently Amended) The method of claim 24, wherein the computing of the CLTD weighting vector comprises:

calculating [[a]] the channel estimate from the received signal; and

computing the CLTD weighting vector based on the channel estimate.

27. (Canceled)

28. (Original) The method of claim 24 wherein the using comprises:

equalizing the received signal; and

despreading the equalized received signal.

29. (Original) The method of claim 24 wherein the using comprises:

equalizing the received signal;

despreading the equalized received signal; and

coherent combining the despread equalized received signal.

30. (Currently Amended) A receiver comprising:

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel, wherein when using a zero-forcing function, estimates for the signal may be expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is a received signal, A is defined as $H\tilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is an estimate of the communications channel, *Nc* is a spreading gain, *Q* is a number of received antennas, *M* is a number of multiple users, $\tilde{W}$ is a weighting vector, $\sqrt{\rho_i}$ is an i-th power source, and *Ci* is an i-th spreading code;

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute the [[a]] weighting vector from the estimate of the communications channel;

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the estimate of the communications channel back to a source of the [[a]] received signal provided by the signal input; and

an interference resistant detection unit coupled to the signal input, the interference resistant detection unit containing circuitry to use the estimate of the communications channel, ~~channel and~~ spreading codes, and the weighting vector to improve interference resistance of the receiver, wherein the receiver receives signals from a plurality of users.

31-32. (Canceled)

33. (Currently Amended) The receiver of claim 30, [[31,]] wherein the interference resistant detection unit first equalizes the received signal and then despreads the equalized received signal.

34. (Currently Amended) The receiver of claim 30, [[31,]] wherein the interference resistant detection unit first equalizes the received signal, then despreads the equalized received signal, and then coherently combines the despread received signal.

35. (Currently Amended) A communications system for multiple users comprising:

a transmitter coupled to a data source, the transmitter containing circuitry to encode and spread a data stream provided by the data source and to transmit the encoded and spread data stream;

a communications channel coupled to the transmitter, the communications channel to carry the transmitted encoded and spread data stream;

a receiver coupled to the communications channel, the receiver comprising

a channel estimation unit coupled to a signal input, the channel estimation unit containing circuitry to calculate an estimate of a communications channel, wherein when using a zero-forcing function, estimates for the signal may be expressed as:

$$y_{ZF} = (A^H A)^{-1} A^H r, N_C Q \geq M,$$

where r is a received signal, A is defined as $H\tilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is an estimate of the communications channel, *Nc* is a spreading gain, *Q* is a number of received antennas, *M* is a number of multiple users, $\tilde{W}$ is a weighting vector, $\sqrt{\rho_i}$ is an i-th power source, and *Ci* is an i-th spreading code;

a weighting vector unit coupled to the channel estimation unit, the weighting vector unit containing circuitry to compute the [[a]] weighting vector from the estimate of the communications channel;

a feedback unit coupled to the weighting vector unit, the feedback unit to provide the estimate of the communications channel back to a source of the [[a]] received signal provided by the signal input; and

an interference resistant detection unit coupled to the signal input, the interference

resistant detection unit containing circuitry to use the estimate of the communications channel, ~~channel and,~~ spreading codes, and the weighting vector to improve interference resistance of the receiver.

36. (Original) The communications system of claim 35, wherein the communications channel is a wireless communications channel.

37. (Original) The communications system of claim 36, wherein the communications system is a code-division multiple access (CDMA) communications system.

38. (Original) The communications system of claim 36, wherein the transmitter transmits the encoded and spread data stream over multiple antennas.

39. (New) A method for interference-resistance for multiple users using closed-loop transmit diversity (CLTD) at a receiver comprising:

receiving a signal;

computing a CLTD weighting vector from the received signal;

providing the CLTD weighting vector to a transmitter; and

using the CLTD weighting vector, a channel estimate, and spreading codes for each user to suppress interference producing an estimate of the signal transmitted by the transmitter, wherein when using a minimum mean-square error function, estimates for the signal may be expressed as:

$$y_{MMSE} = (A^H A + \sigma^2 \Lambda^{-1})^{-1} A^H r = \Lambda A^H (A \Lambda A^H + \sigma^2 I_{NN_C Q})^{-1} r,$$

where r is the received signal, A is defined as $H\widetilde{W}[\sqrt{\rho_1}C_1 \quad \sqrt{\rho_2}C_2 \quad \cdots \quad \sqrt{\rho_M}C_M]$, H is the

channel estimate, *Nc* is the spreading gain, *Q* is the number of received antennas, *M* is the number of multiple users, $\widetilde{W}$ is the weighting vector, ρ_i is the i-th power source, $\Lambda = E[dd^H]$, *I* is the identity matrix, and *Ci* is the i-th spreading code.

40. (New) The method of claim 39, wherein the computation of the estimates for the signal can be implemented using a parallel or serial interference cancellation technique.

41. (New) The method of claim 39 wherein the using comprises:

equalizing the received signal; and

despreading the equalized received signal.

42. (New) The method of claim 41, wherein estimates for the signal may be expressed as:

$$z_{MMSE} = (W^H H^H H\widetilde{W} + (\sigma^2 / \mu) I_{NN_C})^{-1} \widetilde{W}^H H^H R$$

$$= \widetilde{W}^H H^H (H\widetilde{W}\widetilde{W}^H H^H + (\sigma^2 / \mu) I_{NN_C Q})^{-1} r,$$

where $\mu = \frac{1}{N_c} \sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, *H* is the channel estimate, $\widetilde{W}$ is the weighting vector, and *I* is the identity matrix.

43. (New) The method of claim 39 wherein the using comprises:

equalizing the received signal;

despreading the equalized received signal; and

coherent combining the despread equalized received signal.

44. (New) The method of claim 43, wherein the equalizing applies a channel estimate to the received signal.

45. (New) The method of claim 44, wherein estimates for the signal may be expressed as:

$$z_{ZF} = (H^H H)^{-1} H^H r, \quad Q \geq P$$

where r is the received signal, H is the channel estimate, and Q is the number of received antennas.

46. (New) The method of claim 45, wherein estimates for the signal may be expressed as:

$$\begin{aligned} z_{MMSE} &= (H^H H + (\sigma^2 / \mu) I_{NN_C P})^{-1} H^H r \\ &= H^H (HH^H + (\sigma^2 / \mu) I_{NN_C Q})^{-1} r \end{aligned}$$

where $\mu = \frac{1}{N_c} \sum_{k=1}^{M} \rho_k \varepsilon_k$, $\varepsilon_k = E[|d_k(n)|^2]$, r is the received signal, H is the channel estimate, and Q is the number of received antennas, ρ_i is the i-th power source.